

Appendix F
Worksheets for Documentation

F.1 INTRODUCTION.

This appendix provides several worksheets and tables for documenting Technical Project Planning (TPP) information, decisions, and plans. These tools are intended to help a team design and document a data collection program throughout their TPP efforts.

Although these worksheets and tables may initially be overwhelming, users will find that each tool provides a very practical method of implementing the TPP process and documenting the critical information required for a successful projects. At a minimum, use of these tools will enhance team communication and contribute to maintaining institutional site knowledge.

These tools are just one method to achieve implementation of the concepts discussed in this manual. Technical personnel may choose to develop or refine some of the tools presented herein to fit their specific needs.

TPP teams should consider developing electronic files which integrate project objectives; data needs; sampling and analysis planning; and data collection options. Integrated electronic files could then be easily transmitted to various TPP team members and printed as oversized tables (e.g., 11 inches by 17 inches and larger) for specific projects or sites.

Use of standardized worksheets and tables will allow quick and easy quality assurance/quality control review of the work efforts and data collection program plans.

F.2 WORKSHEETS PROVIDED.

The following worksheets are provided for use by teams using the TPP process:

Project Objectives Worksheet	p F-3 to F-4
Site Information Worksheet	p F-5 to F-6
Phase I MFR Worksheet	p F-7 to F-11
Data Need Worksheet-Risk Perspective	p F-13 to F-15
Data Need Worksheet-Compliance Perspective	p F-17 to F-19
Data Need Worksheet-Remedy Perspective	p F-21 to F-23
Data Need Worksheet-Responsibility Perspective	p F-25 to F-27
Sampling and Analysis Planning Worksheet	p F-29 to F-31
Summary Table of Data Collection Options	p F-33 to F-35
Data Quality Objective Worksheet	p F-37

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PROJECT OBJECTIVES WORKSHEET

PAGE ____ of ____

SITE: _____

PROJECT: _____

Project Objective ^a				Data User(s)	Project Objective Classification ^d	
Number	Executable Stage ^b		Description			Source ^c
	Current	Future				
					____ Risk ____ Compliance ____ Remedy ____ Responsibility ____ Basic ____ Optimum ____ Excessive	
					____ Risk ____ Compliance ____ Remedy ____ Responsibility ____ Basic ____ Optimum ____ Excessive	
					____ Risk ____ Compliance ____ Remedy ____ Responsibility ____ Basic ____ Optimum ____ Excessive	

^a Refer to EM 200-1-2, Paragraph 1.2.2.

^b Refer to EM 200-1-2, Paragraph 1.2.5.

^c For example, CERCLA ____, State Regulation ____, FFA Section ____, RCRA Permit, Meeting with Customer or Regulator.

^d Classification of project objectives can only occur after the current project has been identified. Refer to EM 200-1-2, Paragraph 1.3.3.

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PROJECT OBJECTIVES WORKSHEET (examples)

PAGE ____ of ____

SITE: _____

PROJECT: _____

Project Objective ^a				Data User(s)	Project Objective Classification ^d	
Number	Executable Stage ^b		Description			Source ^c
	Current	Future				
1	X		Eliminate from further consideration those releases that pose no significant threat to public health or the environment.	CERCLA 40 CFR 300.420 (c)(i)	<input checked="" type="checkbox"/> Risk <input type="checkbox"/> Compliance <input type="checkbox"/> Remedy <input type="checkbox"/> Responsibility <input checked="" type="checkbox"/> Basic <input type="checkbox"/> Optimum <input type="checkbox"/> Excessive	
2	X		Evaluate and quantify the likely contribution of ABCS Manufacturing's contribution to the surface water and groundwater conditions that were identified during previous investigations.	Legal Counsel Action #218-4401	<input type="checkbox"/> Risk <input type="checkbox"/> Compliance <input type="checkbox"/> Remedy <input checked="" type="checkbox"/> Responsibility <input checked="" type="checkbox"/> Basic <input type="checkbox"/> Optimum <input type="checkbox"/> Excessive	
3		X	Determine if excavated soil will require disposal as a hazardous waste.	RCRA 40 CFR 261.24	<input type="checkbox"/> Risk <input checked="" type="checkbox"/> Compliance <input checked="" type="checkbox"/> Remedy <input type="checkbox"/> Responsibility <input type="checkbox"/> Basic <input checked="" type="checkbox"/> Optimum <input type="checkbox"/> Excessive	
4		X	Classify groundwater in accordance with rules 3745-300-10 and 3745-300-07 of the State Administrative Code (Title 3745, Chapter 300).	State Admin. Code	<input type="checkbox"/> Risk <input checked="" type="checkbox"/> Compliance <input type="checkbox"/> Remedy <input type="checkbox"/> Responsibility <input type="checkbox"/> Basic <input checked="" type="checkbox"/> Optimum <input type="checkbox"/> Excessive	
5		X	Obtain cost and performance data related to life-cycle assessment of treatment wall remedial action at the site.	EPA's Innovative Technologies Advocate	<input type="checkbox"/> Risk <input type="checkbox"/> Compliance <input checked="" type="checkbox"/> Remedy <input type="checkbox"/> Responsibility <input type="checkbox"/> Basic <input checked="" type="checkbox"/> Optimum <input type="checkbox"/> Excessive	
6			Investigate and remediate potentially contaminated soil below existing roadway prior to widening of roadway.	Requested by State Dept. of Health Regulator	<input type="checkbox"/> Risk <input type="checkbox"/> Compliance <input type="checkbox"/> Remedy <input type="checkbox"/> Responsibility <input type="checkbox"/> Basic <input type="checkbox"/> Optimum <input checked="" type="checkbox"/> Excessive	

Several more specific project objectives are typically needed for a project than the few examples provided above.

SITE INFORMATION WORKSHEET

PAGE ____ of ____

SITE: _____

PROJECT: _____

	Site Information Needed ^a	Potential Source(s) of Site Information	User of Site Information ^b	Suggested Means to Obtain Site Information	Deadline for Obtaining Site Information
1					
2					
3					
4					
5					
6					

^a Refer to EM 200-1-2, Paragraphs 1.1.3 and 2.2.

^b Indicate a specific TPP team member (e.g., Risk Data User, Customer, Regulator, Sampling Data Implementor).

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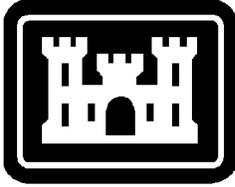
SITE INFORMATION WORKSHEET (examples)

PAGE ____ of ____

SITE: _____

PROJECT: _____

	Site Information Needed	Potential Source(s) of Site Information	User of Site Information	Suggested Means to Obtain Site Information	Deadline for Obtaining Site Information
1	Determine if any threatened or endangered species are known to be present at the site.	State Department of Health	Risk Data User	Written correspondence	Need concurrent with evaluating investigation data.
2	Obtain PA/SI report and all related analytical results.	Customer	all Data Users	Site visit	Before Phase II efforts begin.
3	Aerial photographs between 1952 and the present.	Aerial Surveyor	Remedy and Responsibility Data Users	Telephone call	Needed during Phase II efforts.
4	Agricultural report for county.	Dept. of Agriculture	Responsibility Data User	Telephone call	Evaluation of potential PRPs during Phase II.
5	Local geologic and hydrogeologic information and boring logs from within 2 miles of the site.	State Board of Geology	Hydrogeologist supporting Remedy Data User	Visit State offices	During feasibility study evaluations.



Phase I MFR Worksheet

Author(s) _____ Reviewer _____
 Latest Revision Date _____ Review Date _____

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of Engineers®**

Location: _____
 Site: _____
 Project: _____

(Attach Phase I MFR to PMP)

TPP TEAM

EM 200-1-2, Paragraph 1.1.1

Decision Makers	Data User Perspectives	Data Implementor Perspectives
Customer:	Risk:	Sampling:
Project Manager:	Compliance:	Analysis:
Regulator(s):	Remedy:	
Stakeholders:	Responsibility:	

CUSTOMER'S GOALS

EM 200-1-2, Paragraph 1.1.2

Future Land Use(s) @ Site	Regulatory Compliance Status and Issues	Interim Site Closeout Goal (if applicable)

CUSTOMER'S GOALS (continued)

EM 200-1-2, Paragraph 1.1.2

Site Closeout Statement

Customer's Schedule Requirements

Customer's Site Budget

IDENTIFY SITE APPROACH		
EXISTING SITE INFORMATION AND DATA EM 200-1-2, Paragraphs 1.1.3 and 1.2.1		
Attachment(s) to Phase I MFR	Site Information Repository(ies)	Preliminary Conceptual Site Model
POTENTIAL POINTS OF COMPLIANCE EM 200-1-2, Paragraph 1.2.1.3		
MEDIA OF POTENTIAL CONCERN EM 200-1-2, Paragraph 1.2.1.4		
PROJECT OBJECTIVES EM 200-1-2, Paragraph 1.2.2		
(The TPP team should begin to complete several Project Objective Worksheets at this time.)		

IDENTIFY SITE APPROACH (continued)		
REGULATOR AND STAKEHOLDER PERSPECTIVES		EM 200-1-2, Paragraph 1.2.3
Regulators	Community Interests	Others
PROBABLE REMEDIES		EM 200-1-2, Paragraph 1.2.4
EXECUTABLE STAGES TO SITE CLOSEOUT		EM 200-1-2, Paragraph 1.2.5

IDENTIFY CURRENT PROJECT

SITE CONSTRAINTS AND DEPENDENCIES

EM 200-1-2, Paragraph 1.3.1

- Administrative Constraints and Dependencies

- Technical Constraints and Dependencies

- Legal and Regulatory Milestones and Requirements

CURRENT EXECUTABLE STAGE

EM 200-1-2, Paragraph 1.3.3

(Also list project objective numbers and attach Project Objectives Worksheet with descriptions.)

Basic (current project)	Optimum (future projects)	Excessive (objectives that do not lead to site closeout)

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DATA NEED WORKSHEET- RISK PERSPECTIVE

PAGE ____ of ____

SITE: _____

DATA USER NAME(s): _____

PROJECT: _____

Data Need ^a		Project Objective(s) ^b & Data Need Group	Data Use(s) ^c			Number of Samples ^d			Risk Action Level(s) ^e		Exposure Area(s) / Sample Location(s) and Depth ^f
Contaminant of Concern, or Characteristic of Interest	Media		Current or Future Use	Receptor Group(s)	Receptor's Exposure Route(s)	CL (%)	P (%)	MDRD (%)	Human Health	Ecological	

DATA NEED WORKSHEET- RISK PERSPECTIVE (examples)

Data Need ^a		Project Objective(s) ^b & Data Need Group	Data Use(s) ^c			Number of Samples ^d			Risk Action Level(s) ^e		Exposure Area(s) / Sample Location(s) and Depth ^f
Contaminant of Concern, or Characteristic of Interest	Media		Current or Future Use	Receptor Group(s)	Receptor's Exposure Route(s)	CL (%)	P (%)	MDRD (%)	Human Health	Ecological	
Vinyl Chloride	GW	1 Basic	Current Use	Industrial Workers	Incidental Ingestion, Dermal, & Inhalation	2			N/A	N/A	The 2 worst case downgradient wells found @ PA/SI
Vinyl Chloride	GW	2 Basic	Future Use	Resident	Incidental Ingestion, Dermal, & Inhalation	2			0.019 ug/L (RBC)	N/A	The 2 worst case downgradient wells found @ PA/SI
Lead and Cadmium	Soil	1 Basic	Current Use	Industrial Workers	Ingestion & Dermal	CL = 80% P = 90% MDRD = 20%			1,000 and 1,000 mg/kg	N/A	within area outlined on attached figure and @ 0" to 24"
Lead and Cadmium	Soil	2 Basic	Future Use	Resident	Ingestion & Dermal	CL = 90% P = 95% MDRD = 20%			400 and 39 mg/kg	0.1 and 2.5 mg/kg	within area outlined on attached figure and @ 0" to 24"
Total Organic Carbon	Soil	2 Basic	Future Use	GW Model	(fate & transport)	2			+/- 0.1%		w/i screen interval of the 2 new wells on attached figure
Hydraulic Conductivity	GW	2 Basic	Future Use	GW Model, aquifer viability and classification	(fate & transport)	2			(rising head slug test using data logger and transducers)		At the 2 new wells shown on the attached figure

DATA NEED WORKSHEET- RISK PERSPECTIVE
(instructions)

^a Data Need

List each specific environmental data need that is required to satisfy a project objective(s) identified during Phase I. (Site information worksheet should be used for site information needs.) Limit requests for “full suite” to select locations or areas, and only when necessary to satisfy a project objective. A unique data need number (e.g., risk-1) should be assigned to each data need.

^b Project Objective(s) & Data Need Group

Correlate each data need with the project objective(s) that the data will be used to help satisfy. Data needs listed without a corresponding project objective number(s) and data need group (i.e., basic, optimum, excessive) should not be included in the data collection program. (Project objectives are discussed in Paragraph 1.2.2, documented using the Project Objective Worksheet, and sequentially numbered for record keeping.)

^c Data Use(s)

Communicate the intended use(s) of the data. (Multiple worksheet lines should be used to represent each exposure scenario when sample numbers; risk action levels; sample areas or locations; or the applicable project objectives differ.)

^d Number of Samples

Define the number of samples based on the accepted practices of the intended data use(s). Worksheet entry should represent minimum number of samples required to provide acceptable data quality for the intended data use(s). Note that number of samples may be a fixed number or a dynamic estimate based on intended data use and whether ESC methods

are being employed. Other guidance resources should be referenced to consider best use of classical statistics and geostatistics if probabilistic methods are appropriate for establishing the number of samples required. Desired Confidence Limit (CL), Power (P), and Minimum Detectable Relative Difference (MDRD) should be provided when probabilistic decisions are involved. (Refer to Paragraph 2.1.4 regarding probabilistic/nonprobabilistic decisions and efforts for developing the rationale for designating the appropriate number of samples.)

^e Risk Action Level(s)

Specify risk action levels for each data need. (Entries in this column help ensure that laboratory quantitation limits are appropriate so the resulting data can represent detectable results below these concentration(s) of interest for decision making.)

^f Exposure Area(s)/Sample Location(s) and Depth

Specify the area or physical location(s) that would need to be sampled to provide the data required for the intended data use(s). (Specific sampling locations should only be designated when they are the known critical locations for the intended use.) Site maps should be attached as appropriate to help delineate the appropriate sampling area or location(s), as well as sampling depth(s) where applicable. (This information will be used by data implementors to ensure the required data is obtained, and to identify opportunities to co-locate sampling efforts and develop data collection options.)

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DATA NEED WORKSHEET- COMPLIANCE PERSPECTIVE

PAGE ____ of ____

SITE: _____

DATA USER NAME(s): _____

PROJECT: _____

Data Need ^a		Project Objective(s) ^b & Data Need Group	Data Use ^c		Number of Samples ^d	Compliance Reference Concentration ^e	Point(s) of Compliance/Sample Locations(s) and Depth ^f
Contaminant of Concern, or Characteristic of Interest	Media		Regulatory Program or Statute, and Citation	Specific Use			

DATA NEED WORKSHEET- COMPLIANCE PERSPECTIVE
(examples)

Data Need ^a		Project Objective(s) ^b & Data Need Group	Data Use ^c		Number of Samples ^d	Compliance Reference Concentration ^e	Point(s) of Compliance/Sample Locations(s) and Depth ^f
Contaminant of Concern, or Characteristic of Interest	Media		Regulatory Program or Statute, and Citation	Specific Use			
Chromium, Cr	Soil	4 Basic	RCRA 40 CFR 261.24	Determine if IDW is hazardous waste.	1 composite sample per rolloff container	5.0 mg/L (TCLP Cr)	Representative sample of waste stream (soil)
Total Chromium, Cr	GW	4 Basic	RCRA 40 CFR 261.24		1 sample per drum	5.0 mg/L (Total Cr)	Representative sample of waste stream (purge water)
Chromium, Cr III	Water	6 Optimum	CWA 40 CFR 131	Determine if treatment plant effluent requires pre-treatment prior to discharge to surface water.	1 sample (time frame is TBD)	180 ug/L	Groundwater treatment plant effluent at point source discharge location
Chromium, Cr VI	Water	6 Optimum	CWA 40 CFR 131		1 sample (time frame is TBD)	10 ug/L	Groundwater treatment plant effluent at point source discharge location
Chromium, Cr	GW	7 Optimum	SDWA 40 CFR 141	Do GW concentrations exceed MCL?	1 per well	0.1 mg/L	Required at the point of use tap, but sampling at monitoring wells is adequate.

DATA NEED WORKSHEET- COMPLIANCE PERSPECTIVE
(instructions)

^a Data Need

List each specific environmental data need that is required to satisfy a project objective(s) identified during Phase I. (Site information worksheet should be used for site information needs.) Limit requests for “full suite” to select locations or areas, and only when necessary to satisfy a project objective. A unique data need number (e.g., compliance-1) should be assigned to each data need.

^b Project Objective(s) & Data Need Group

Correlate each data need with the project objective(s) that the data will be used to help satisfy. Data needs listed without a corresponding project objective number(s) and data need group (i.e., basic, optimum, excessive) should not be included in the data collection program. (Project objectives are discussed in Paragraph 1.2.2, documented using the Project Objective Worksheet, and sequentially numbered for record keeping.)

^c Data Use(s)

Communicate the intended use(s) of the data. (Multiple worksheet lines should be used to represent each applicable regulatory statute when sample numbers; reference concentration; sample areas or locations; or the applicable project objectives differ.)

^d Number of Samples

Define the number of samples based on the accepted practices of the intended data use(s). Worksheet entry should represent minimum number of samples required to provide acceptable data quality for the intended data use(s). Note that the number of samples may be a fixed number or a dynamic estimate based on intended data use and whether ESC

methods are being employed. Other guidance resources should be referenced to consider the best use of classical statistics and geostatistics if probabilistic methods are appropriate for establishing the number of samples required. (Refer to Paragraph 2.1.4 for discussions regarding probabilistic/nonprobabilistic decisions and efforts for developing the rationale for designating the appropriate number of samples.)

^e Compliance Reference Concentration

Specify the reference concentration of interest for each data need. (Entries in this column help ensure that laboratory quantitation limits are appropriate so the resulting data can represent detectable results below these concentration(s) of interest for decision making.)

^f Point(s) of Compliance/Sample Location(s) and Depth

Specify the point(s) of compliance or physical location(s) that would need to be sampled to provide the data required for the intended data use(s). (Specific sampling locations should only be designated when they are the known critical locations for the intended use.) Site maps should be attached as appropriate to help delineate the appropriate sampling area or location(s), as well as sampling depth(s) where applicable. (This information will be used by data implementors to ensure the required data is obtained, and to identify opportunities to co-locate sampling efforts and develop data collection options.)

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DATA NEED WORKSHEET- REMEDY PERSPECTIVE

PAGE ____ of ____

SITE: _____

DATA USER NAME(s): _____

PROJECT: _____

Data Need ^a		Project Objective(s) ^b & Data Need Group	Data Use ^c		Number of Samples ^d	Concentration of Interest or Sensitivity of Measurement(s) ^e	Remediation Area(s) / Sample Locations(s) and Depth ^f
Contaminant of Concern, or Characteristic of Interest	Media		Remedy Method(s) of Interest	Criteria to be Considered			

DATA NEED WORKSHEET- REMEDY PERSPECTIVE
(examples)

Data Need ^a		Project Objective(s) ^b & Data Need Group	Data Use ^c		Number of Samples ^d	Concentration of Interest or Sensitivity of Measurement(s) ^e	Remediation Area(s) / Sample Locations(s) and Depth ^f
Contaminant of Concern, or Characteristic of Interest	Media		Remedy Method(s) of Interest	Criteria to be Considered			
Vinyl Chloride	Air	7 Optimum	air stripping	effectiveness control	3 over 3 day operating period	2.0 gm/hr	At stack emissions after air stripper.
Depth to Bedrock	Soil	8 & 9 Optimum	slurry wall	implementability & conceptual cost estimate	1 location every 100'	measurements should be within +/- 1'	Along planned alignments of slurry wall and treatment wall as shown on attached figure
			treatment wall		1 location every 25'		
hydraulic conductivity, grain size distribution, and porosity	GW	10 Optimum	treatment wall	effectiveness, implementability & conceptual cost estimate	5	ASTM, ASTM, +/- 0.1%	Preferred locations distributed along middle of planned alignment of treatment wall
Lead and Cadmium	Soil	11 Optimum	offsite disposal	Removal action estimate of transportation and disposal costs	composite 1 per 100 cubic yards of stockpiled soils	TCLP	Random, composite samples from within each stockpiled soil pile (i.e., BV2, BV4, BV7-9, and BV12) on the attached figure.
pH, total dissolved solids, and total organic carbon	SW	12 & 13 Optimum	onsite water treatment by electrochemical precipitation or ion exchange	effectiveness, implementability, cost, and O&M	5	pH w/I +/- .5, TDS and TOC w/i +/- .5 mg/l	Surface water samples half-way down water column; 2 in the center of basin 15, and 3 along the edges.

DATA NEED WORKSHEET- REMEDY PERSPECTIVE
(instructions)

^a Data Need

List each specific environmental data need that is required to satisfy a project objective(s) identified during Phase I. (Site information worksheet should be used for site information needs.) Limit requests for “full suite” to select locations or areas, and only when necessary to satisfy a project objective. A unique data need number (e.g., rem-1) should be assigned to each data need.

^b Project Objective(s) & Data Need Group

Correlate each data need with the project objective(s) that the data will be used to help satisfy. Data needs listed without a corresponding project objective number(s) and data need group (i.e., basic, optimum, excessive) should not be included in the data collection program. (Project objectives are discussed in Paragraph 1.2.2, documented using the Project Objective Worksheet, and sequentially numbered for record keeping.)

^c Data Use(s)

Communicate the intended use(s) of the data. (Multiple worksheet lines should be used to represent each remedy being evaluated, designed, or operated when sample numbers; reference concentration; sample areas or locations; or the applicable project objectives differ.)

^d Number of Samples

Define the number of samples based on the accepted practices of the intended data use(s). Worksheet entry should represent minimum number of samples required to provide acceptable data quality for the intended data use(s). Note that number of samples may be a fixed number or a dynamic estimate based on intended data use and whether ESC methods

are being employed. Other guidance resources should be referenced to consider best use of classical statistics and geostatistics if probabilistic methods are appropriate for establishing the number of samples required. (Refer to Paragraph 2.1.4 regarding probabilistic/nonprobabilistic decisions and efforts for developing the rationale for designating appropriate number of samples.)

^e Concentration of Interest or Sensitivity of Measurement(s)

Specify concentration of interest, or required sensitivity of measurement, for each data need. Measurement sensitivity could be noted as \pm 50 feet for a preliminary estimate of the areal extent of a surface cap, or \pm 5 mg/L of benzene in groundwater for an evaluation of potential remedy methods. (These entries help ensure that appropriate sampling and analysis methods are used to produce data of adequate quality for use.)

^f Remediation Area(s)/Sample Location(s) and Depth

Specify area or physical location(s) that need to be sampled to provide data required for the intended data use(s). (Specific sampling locations should only be designated when they are critical locations for the intended use.) Site maps should be attached as appropriate to help delineate the appropriate sampling area or location(s), as well as sampling depth(s) where applicable. (This information will be used by data implementors to ensure the required data is obtained, and to identify opportunities to collocate sampling efforts and develop data collection options.)

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DATA NEED WORKSHEET- RESPONSIBILITY PERSPECTIVE

PAGE ____ of ____

SITE: _____

DATA USER NAME(s): _____

PROJECT: _____

Data Need ^a		Project Objective(s) ^b & Data Need Group	Data Use ^c		Number of Samples ^d	Concentration of Interest or Sensitivity of Measurement(s) ^e	Responsibility Area(s) / Sample Locations(s) and Depth ^f
Contaminant of Concern, or Characteristic of Interest	Media		Related Historical Information/Criteria	Phase of Responsibility Determination			

DATA NEED WORKSHEET- RESPONSIBILITY PERSPECTIVE
(examples)

Data Need ^a		Project Objective(s) ^b & Data Need Group	Data Use ^c		Number of Samples ^d	Concentration of Interest or Sensitivity of Measurement(s) ^e	Responsibility Area(s) / Sample Locations(s) and Depth ^f
Contaminant of Concern, or Characteristic of Interest	Media		Related Historical Information/Criteria	Phase of Responsibility Determination			
All metals	SW	21 Basic	Upgradient industries discharge to stream that traverses site	Investigating prospect of other PRPs at site	6		2 where stream enters site, 2 immediately downgradient of source area and 2 where stream discharges from site.
All metals	GW	21 Basic	Upgradient sites may contribute to GW conditions entering site	Investigating prospect of other PRPs at site	3		Refer to attached figure for preferred sampling areas upgradient of the site.
TCE	GW	21 Basic	Upgradient sites may contribute to GW conditions entering site	Investigating prospect of other PRPs at site	3	5.0 ug/L	Refer to attached figure for preferred sampling areas upgradient of the site.
BTEX	GW	22 Optimum	Adjacent service stations' contribution to site	Cost allocation analysis	4	B = 1.51 ug/L T = 1,600 ug/L E = 800 ug/L X = 16,000 ug/L	Existing wells GB1s, GB4s, GB5s, and GB6s should be sampled.

DATA NEED WORKSHEET- RESPONSIBILITY PERSPECTIVE
(instructions)

^a Data Need

List each specific environmental data need that is required to satisfy a project objective(s) identified during Phase I. (Site information worksheet should be used for site information needs.) Limit requests for “full suite” to select locations or areas, and only when necessary to satisfy a project objective. A unique data need number (e.g., res-1) should be assigned to each data need.

^b Project Objective(s) & Data Need Group

Correlate each data need with the project objective(s) that the data will be used to help satisfy. Data needs listed without a corresponding project objective number(s) and data need group (i.e., basic, optimum, excessive) should not be included in the data collection program. (Project objectives are discussed in Paragraph 1.2.2, documented using the Project Objective Worksheet, and sequentially numbered for record keeping.)

^c Data Use(s)

Communicate the intended use(s) of the data. (Multiple worksheet lines should be used to represent each responsibility consideration being evaluated when sample numbers; reference concentration; sample areas or locations; or the applicable project objectives differ.)

^d Number of Samples

Define the number of samples based on the accepted practices of the intended data use(s). Worksheet entry should represent minimum number of samples required to provide acceptable data quality for the intended data use(s). Note that the number of samples may be a fixed number or a dynamic estimate based

on intended data use and whether ESC methods are being employed. Other guidance resources should be referenced to consider the best use of classical statistics and geostatistics if probabilistic methods are appropriate for establishing the number of samples required. (Refer to Paragraph 2.1.4 for discussions regarding probabilistic/nonprobabilistic decisions and efforts for developing the rationale for designating the appropriate number of samples.)

^e Concentration of Interest or Sensitivity of Measurement(s)

Specify the concentration of interest, or the required sensitivity of the measurement, for each data need. (Entries in this column help ensure that the appropriate methods are used and the resulting data will be of adequate quality for the intended data use.)

^f Responsibility Area(s)/Sample Location(s) and Depth

Specify the area or physical location(s) that would need to be sampled to provide the data required for the intended data use(s). (Specific sampling locations should only be designated when they are the known critical locations for the intended use.) Site maps should be attached as appropriate to help delineate the appropriate sampling area or location(s), as well as sampling depth(s) where applicable. (This information will be used by data implementors to ensure the required data is obtained, and to identify opportunities to collocate sampling efforts and develop data collection options.)

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SAMPLING AND ANALYSIS PLANNING WORKSHEET

PAGE ____ of ____

SITE: _____

DATA IMPLEMENTORS:

Sampling: _____

PROJECT: _____

Analysis: _____

Project Objective(s) ^a				
Data Need Designation(s) ^a				
Medium ^a				
Contaminant of Concern ^a				
Sampling Information ^b	Method			
	Area or Location of Interest			
	Depth(s)			
Concentration of Interest ^c	Risk			
	Compliance			
	Remedy			
	Responsibility			
Analysis Information ^d	Analyte(s)			
	Preparation Method			
	Analysis Method			
	Method Detection Limit (MDL)			
	Quantitation Limit (Low Standard)			
	Reporting Limit			
Number of Samples ^e	Matrix			
	QC Duplicates			
	QA Duplicates			
	Field Blanks			
	Trip Blanks			
	MS/MSD			
	Other			

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SAMPLING AND ANALYSIS PLANNING WORKSHEET (examples)

PAGE 1 of 1

SITE: _____

DATA IMPLEMENTORS:

Sampling: _____

PROJECT: _____

Analysis: _____

Project Objective(s) ^a		3	5	6
Data Need Designation(s) ^a		RI-3, C-2, RM-2	RM-4	RI-6, C-3
Medium ^a		GW	Soil	GW
Contaminant of Concern ^a		TCE	--	Lead
Sampling Information ^b	Method	Low Flow	split spoon w/ Shelby attachment	Low Flow
	Area or Location of Interest	See Figure 1	See Figure 2	See Figure 1
	Depth(s)	1st aquifer	18' - 20' and 26'-28' bls	perched aquifer
Concentration of Interest ^c	Risk	10 ppb	--	15 ppb
	Compliance	20 ppb	--	15 ppb
	Remedy	25 ppb	+/- 5%	--
	Responsibility	--	--	--
Analysis Information ^d	Analyte(s)	VOCs	Moisture Content	Lead
	Preparation Method	SW-846 3520C	--	SW-846 3020A
	Analysis Method	SW-846 8260B	ASTM D2216-80	SW-846 7421
	Method Detection Limit (MDL)	0.05 ug/L	--	1.0 ug/L
	Quantitation Limit (Low Standard)	5.0 ug/L	--	--
	Reporting Limit	5.0 ug/L	--	5.0 ug/L
Number of Samples ^e	Matrix	4	24	5
	QC Duplicates	1	2	1
	QA Duplicates	1	2	1
	Field Blanks	0	1	0
	Trip Blanks	1	1	0
	MS/MSD	1	2	1
	Other	none	none	none

SAMPLING AND ANALYSIS PLANNING WORKSHEET
(instructions)

^a Worksheet entries for **project objective(s)**, **data need designation(s)**, **medium**, and **contaminant of interest** should correlate directly to data need worksheets prepared during Phase II of the TPP efforts.

^b **Sampling Information**

Data needs of all data users should first be sorted and combined as much as possible while still fulfilling all unique data need requirements. Figures or maps will generally need to be attached to designate necessary sampling areas or locations.

^c **Concentration of Interest**

List the concentration of interest for each data user as a means to identify the most appropriate MDL(s). Data implementors are cautioned to only apply the most stringent data quality requirements to those locations designated by the data users based on the intended data use.

^d **Analysis Information**

Analyte: A discrete chemical component of a sample to be identified or measured through analysis.

Prep Method: Method used to extract or digest analyte of interest from sample prior to analysis.

Analysis Method: Method used to determine concentration of analyte of interest in a sample.

Method Detection Limit: The minimum concentration of an analyte that can be measured within a given matrix and reported with a 99 percent confidence that the analyte

concentration is greater than zero. MDLs shall be estimated for each target analyte using the procedures presented in 40 CFR, Part 136, Appendix B, or equivalent statistical approach.

Quantitation Limit: The minimum concentration of an analyte in a specific matrix that can be identified and quantified within specified limits of precision and accuracy. The quantitation limit should be defined as the low calibration standard from the initial calibration curve.

Reporting Limit: Project specific threshold limit below which a numerical value for data is reported as less than or non-detect.

^e **Number of Samples**

The number of matrix samples should be based on those required by the data users and not just a summation of their needs. Data implementors should refer to EM 200-1-3 for guidance regarding the appropriate number of QA/QC duplicate samples, blanks, and MS/MSD samples. The need to collect additional samples classified as “other” should be noted on the table. If the number of matrix samples is a dynamic estimate based on intended data use, then the corresponding decision rationale should be attached as developed by the data user employing ESC methods at the site.

TPP teams should consider developing integrated electronic worksheets or oversized tables (e.g., 11 inches by 17 inches and larger) for specific projects or sites.

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Summary Table of Data Collection Options^a

SITE _____
PROJECT _____

DATA IMPLEMENTORS

Sampling _____
Analysis _____

DATE _____

Data Collection Option ^b	Number of Samples ^c						Order-of-Magnitude Cost (dollars)	Comments ^d
	Air	Surface Water	Sediment	Soil	Ground Water	Other _____		
Excessive								
Optimum								
Basic								

Summary Table of Data Collection Options^a
(example)

Data Collection Option ^b	Number of Samples ^c						Order-of-Magnitude Cost (dollars)	Comments ^d
	Air	Surface Water	Sediment	Soil	Ground Water	Other		
Excessive					4 (State Regulator expects 9 new wells)	12 (soil gas study desired by Customer)	\$111,000 and \$230,000	Use of existing groundwater wells and the additional 5 wells included in the Basic option should be sufficient for long-term monitoring of closed site (project objective 8). Soil gas study around perimeter of landfill is not a regulated requirement for closed site.
Optimum				15		Topographic survey of cap while surveying new wells	\$15,000 and \$4,500	Collection of 15 soil samples from new well boreholes will be used for establishing deep soil background conditions for OU4 at the facility. (Savings of nearly \$65,000 and 45 days.) Baseline topographic survey will be required within 2 years of site closure. This can be done during the current project, saving \$3,500, and ensure compliance with closure monitoring requirements.
Basic		14	28	17	5		\$790,000	Option meets schedule and cost constraints of project. However, ... 1. The data needed to satisfy Project Objective 9, the lowest priority Project Objective associated with the current project, will not be met. 2. Some field screening results are proposed for use in the Baseline Risk Assessment.

SUMMARY TABLE OF DATA COLLECTION OPTIONS
(instructions)

^a Development of all three types of data collection options may not be possible or appropriate on some sites. For example, if no data needs were requested, imposed, or mandated above the data need or data quality requirements of the data users are involved, then the “excessive” data collection option is not necessary. Although development of an optimum data collection option should always be pursued, recommendation of an optimum data collection option may be deemed inappropriate if the data needed to satisfy the current project objectives already exceeds project cost and schedule constraints.

^b **Data Collection Option**

Refer to Paragraphs 3.2 and 3.3 for discussions regarding the development and documentation of data collection options, respectively.

^c **Number of Samples**

Indicate the total number of samples for each medium, including QA/QC samples, and attach Sampling and Analysis Planning Worksheets for each data collection option summarized above.

^d **Comments**

Provide brief descriptions of the imposed requirements grouped in the excessive data collection option; the cost and schedule benefits associated with the optimum data collection option; and the limitations, if any, associated with the basic data collection option.

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DATA QUALITY OBJECTIVE WORKSHEET

PAGE ____ of ____

SITE: _____

PROJECT: _____

DQO STATEMENT NUMBER: _____

DQO Element Number ^a	DQO Element Description ^a	Site-Specific DQO Statement
Intended Data Use(s):		
1	Project Objective(s) Satisfied	
Data Need Requirements:		
2	Data User Perspective(s)	
3	Contaminant or Characteristic of Interest	
4	Media of Interest	
5	Required Sampling Locations or Areas and Depths	
6	Number of Samples Required	
7	Reference Concentration of Interest or Other Performance Criteria	
Appropriate Sampling and Analysis Methods:		
8	Sampling Method	
9	Analytical Method	

^a Refer to EM 200-1-2, Paragraph 4.2.1